WHAT IS CLAIMED IS:

1. A method of implanting an annuloplasty ring in a heart valve annulus, comprising:

providing a resilient annuloplasty ring having a relaxed diameter;

stretching the annuloplasty ring to an expanded diameter commensurate with the diameter of a dilated heart valve annulus;

maintaining the annuloplasty ring at its expanded diameter while attaching the annuloplasty ring to the dilated heart valve annulus; and

permitting the annuloplasty ring to contract inward from its expanded diameter so as to decrease the size of the attached heart valve annulus.

2. The method of claim 1, wherein the resilient annuloplasty ring comprises a resilient inner sizing member and an outer attachment sheath enclosing the sizing member, and wherein the step of attaching the annuloplasty ring to the dilated heart valve annulus comprises using an attachment device to physically connect the attachment sheath to the annulus.

3. The method of claim 2, wherein the attachment device comprises a plurality of members positioned on the annuloplasty ring.

4. The method of claim 3, wherein the plurality of members is selected from the group consisting of:

needles;

barbs; and

hooks.

5. The method of claim 3, wherein the material of the plurality of members is selected from the group consisting of:

stainless steel;

titanium; and

a Nickel-Titanium alloy.

6. The method of claim 2, wherein the attachment device comprises at least one suture, and wherein the step of attaching the annuloplasty ring to the dilated heart valve annulus comprises passing the suture through the attachment sheath and through the heart valve annulus.

7. The method of claim 2, wherein said outer attachment sheath is selected from the group consisting of:

biologically compatible fabric mesh;

polyethylene terepthalate;

polyester knit;

PTFE knit; and

ePTFE knit.

8. The method of claim 2, wherein said outer attachment sheath comprises a medicament to induce tissue growth.

9. The method of claim 1, wherein the method further comprises limiting contraction of the annuloplasty ring to a contracted diameter that is larger than the relaxed diameter.

10. The method of claim 7, wherein the annuloplasty ring includes a resilient inner sizing member and a series of support members positioned on the inner sizing member, and wherein the step of limiting contraction is accomplished by engagement of the support members with one another.

11. The method of claim 8, wherein each support member comprises a body member having a lumen formed therein, said lumen being capable of receiving the sizing member therein.

12. The method of claim 1, wherein said resilient inner sizing member comprises a biologically compatible elastomer.

13. The method of claim 1, wherein the step of maintaining the annuloplasty ring at its expanded diameter comprises positioning the annuloplasty ring on an insertion device.

14. The method of claim 11, wherein the annuloplasty ring is positioned on the insertion device at the time of manufacture.

15. The method of claim 11, wherein the annuloplasty ring is positioned on the insertion device immediately prior to implantation.

16. A method of implanting a self-molding annuloplasty ring in a heart valve annulus, comprising:

providing a resilient annuloplasty ring having a relaxed diameter, the annuloplasty ring including a resilient inner sizing member and an outer attachment sheath;

stretching the annuloplasty ring to an expanded diameter commensurate with the diameter of a dilated heart valve annulus;

positioning the expanded annuloplasty ring on an insertion device;

delivering the insertion device and expanded annuloplasty ring to the dilated heart valve annulus;

attaching the annuloplasty ring to the dilated heart valve annulus; and

removing the insertion device so as to permit the annuloplasty ring to contract inward from its expanded diameter and decrease the size of the attached heart valve annulus.

17. The method of claim 14, wherein the step of attaching the annuloplasty ring to the dilated heart valve annulus comprises using an attachment device to physically connect the attachment sheath to the annulus.

18. The method of claim 15, wherein the attachment device comprises a plurality of members positioned on the annuloplasty ring.

19. The method of claim 16, wherein the plurality of members is selected from the group consisting of:

needles;

barbs; and

hooks.

20. The method of claim 16, wherein the material of the plurality of members is selected from the group consisting of:

stainless steel;

titanium; and

a Nickel-Titanium alloy.

21. The method of claim 15, wherein the attachment device comprises at least one suture, and wherein the step of attaching the annuloplasty ring to the dilated heart valve annulus comprises passing the suture through the attachment sheath and through the heart valve annulus.

22. The method of claim 14, wherein said outer attachment sheath is selected from the group consisting of:

biologically compatible fabric mesh;

polyethylene terepthalate;

polyester knit;

PTFE knit; and

ePTFE knit.

23. The method of claim 14, wherein said outer attachment sheath comprises a medicament to induce tissue growth.

24. The method of claim 14, wherein the method further comprises limiting contraction of the annuloplasty ring to a contracted diameter that is larger than the relaxed diameter.

25. The method of claim 22, wherein the annuloplasty ring further includes a series of support members positioned on the inner sizing member, and wherein the step of limiting contraction is accomplished by engagement of the support members with one another.

26. The method of claim 23, wherein each support member comprises a body member having a lumen formed therein, said lumen being capable of receiving the sizing member therein.

27. The method of claim 14, wherein said resilient inner sizing member comprises a biologically compatible elastomer.

28. The method of claim 14, wherein the annuloplasty ring is positioned on the insertion device at the time of manufacture.

29. The method of claim 14, wherein the annuloplasty ring is positioned on the insertion device immediately prior to implantation.